PM2.5 Monitoring Network Design

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I. Monitoring Network Plan

A. Describes the planned PM2.5 monitoring network, including:
1. Monitoring site locations
2. Types of samplers at each site
3. Other site parameters such as spatial scale and sampling frequency

B. The monitoring network plan, due to the U.S. EPA by July 1, 1998, covers mid '98 to mid '99. An annual update in mid '99 can address changes.

II. Almost 10 years of existing dichot data in California

A. 20 PM fine sites
B. Higher PM fine in late fall and early winter
C. Nitrates more significant than sulfates
D. Regional PM variations within the State

III. Purpose of Monitoring Planning Areas for PM2.5

A. Monitoring planning area (MPA) is a common area used for planning monitoring locations for PM2.5. The MPAs <u>are not intended</u> to be used for area designations or planning control measures. The U.S. EPA has not yet established the boundaries to be used for these purposes.

B. The following are Monitoring Planning Areas for the PM2.5 monitoring network:

Bay Area Air Quality Management District (AQMD) *
Coachella Valley *
Great Basin Unified Air Pollution Control District (APCD) *
Imperial County APCD
Lake County Air Basin
Lake Tahoe Air Basin
Mojave Desert Air Basin
Monterey Bay Unified APCD *
Mountain Counties Air Basin
North Coast Air Basin
Northeast Plateau Air Basin
Sacramento Valley Air Basin
San Diego County APCD *
San Luis Obispo County APCD *
San Joaquin Valley Unified AQMD *
Santa Barbara County APCD
South Coast Air Basin *
Ventura County APCD *
** District drafts the MPA plan*

IV. Network development process

A. Cooperation and coordination between 30 districts, EPA Region 9 and ARB
B. Iterative process
C. Proactive approach
    1. Express concerns to EPA early
    2. Ensure sufficient funding

V. ARB Proposal I - November 21, 1997

A. Roles and responsibilities
    1. The following districts will prepare and send to the ARB network plans for their jurisdictions:
    South Coast AQMD, Bay Area AQMD, San Joaquin Valley Unified APCD, San Diego County APCD, Ventura County APCD, Monterey Bay Unified APCD, San Luis Obispo County APCD, and Great Basin Unified APCD.
    2. The ARB will develop the plan for the remainder of the state and will ask districts in these areas to review their respective portions of the plan.
    3. The ARB will assemble a statewide plan which will incorporate district plans.

B. Schedule for establishing a network (included as Attachment 1)

C. Proposed PM2.5 network for 1998
    1. 78 PM2.5 monitoring sites
    2. Siting factors: PM data (PM2.5 and PM10), population statistics, land use, meteorological conditions, and possible emissions hot spots.

VI. Comments on Proposal I

A. Proposal I well received
B. Standard response form
C. PM2.5 Air Monitoring Technical Advisory Committee (AMTAC) Subcommittee Meeting in mid December
D. Input from districts
E. Discussions within ARB

VII. Revised list of PM2.5 monitoring sites proposed for deployment in 1998

A. 78 PM2.5 sites will be established in California by the state and local agencies in 1998.

B. All of the PM2.5 sites established in 1998 will operate Federal Reference Method (FRMs) monitors to provide data for attainment/nonattainment decisions

C. Data from all 1998 sites can be compared to both the annual standard and the 24-hour standard because each site meets the following conditions:

1. Population-oriented location; and
2. Representative of a neighborhood (77 sites) or urban (1 site) spatial scale

E. For specific site locations and list of selected parameters for each of the proposed sites, see Attachment 2.

VIII. ARB Proposal II - February 20, 1998

A. Review of 1998 network
B. Sampling frequency input requested
C. Proposed network for 1999 and beyond
   1. Mass measurements
   2. Chemical speciation
   3. Transport assessment

IX. Sampling frequency:

A. The federal requirements call for everyday sampling for PM2.5 at certain monitoring sites and one in three day sampling at all other PM2.5 sites. All PM10 sites are to sample on a one in three day schedule.

B. During 1998, the start-up phase of initial deployment, the U.S. EPA will allow flexibility in sampling frequency. After the start-up phase, the U.S. EPA is willing to accept deviation from the requirements and waivers as long as a proposed sampling schedule is supported by a reasonable justification. A sampling schedule less frequent than required must be justified in the plan and approved by Region IX. The justification should be based on the available particulate matter data and future data needs, rather than insufficient resources.

C. The requirements allow the following waivers to the required sampling schedule:

   1. A waiver from the everyday sampling schedule requirement for 1 calendar year from the time a PM2.5 sequential sampler has been approved by the EPA. This is anticipated to be in March 1998.

   2. Exemptions from everyday or one in 3 day sampling during seasons or periods of low PM2.5. (A minimum frequency of one in 6 day sampling will be required.)

   3. Alternatives to everyday sampling schedules at sites with correlated acceptable continuous analyzers

   4. Exemptions from one in 3 day sampling where existing information suggest that maximum 24-hour measurements are less than the level of the standard.

D. The districts and the ARB will propose sampling schedules that are appropriate for each MPA, with possible variation within the MPA, based on the needs for PM2.5 data (e.g., to support area designations, modeling, health studies, and other

monitoring objectives). This proposed schedule will cover the July 1, 1998 through June 30, 1999 period. Any sampling schedule less frequent than the required schedule will be justified in the monitoring plan based on the available data and future data needs. A proposed sampling schedule for each monitoring site is included in Attachment 3.

E. The new minimum required sampling frequency for PM10 is 1 in 3 day. The Air Resources Board and the local air pollution control districts in California are requesting that the U.S. EPA Region 9 grant a statewide waiver allowing sampling at the current schedule of 1 in 6 day, with certain exceptions to be determined on a case by case basis. Monitoring sites with maximum 24-hour concentrations close to the 24-hour standard may be required to sample everyday or on a 1 in 3 day schedule. For those areas in which the annual standard is the controlling standard, the minimum sampling schedule for all monitors in the area would be 1 in 6 day.

X. Additional sites with PM2.5 FRM monitors considered for deployment in 1999

A. Additional sites with PM2.5 FRM monitors should help satisfy the following monitoring objectives:

1. Better define boundaries of nonattainment areas;
2. Better geographical representation; or
3. Support health study.

B. Districts input on additional sites considered for deployment in 1999 is included in Attachment 4. Not all districts have responded.

XI. PM2.5 chemical speciation sampling

A. A national chemical speciation sampling and analysis program will be developed by January 1, 1999. The speciation program will provide identification of the chemical constituents including elements, elemental and organic fractions of carbon, and major ions including nitrate, sulfate, chloride, ammonium.

B. The design of the speciation sampler is similar to the IMPROVE sampler (a type of sampler that has been used for visibility monitoring in the Federal Class I areas). The sampler will have three filters: a teflon filter for mass weighing, elemental and ion analysis; a nylon filter for nitrate capture; and a quartz filter for combustion analysis to separate the elemental and organic carbon.

C. An estimated 37 sites in California will be funded by the U.S. EPA to conduct PM2.5 speciation monitoring (not including speciation monitoring in Class I areas), beginning in 1999.

D. Attachment 4 includes an initial list of speciation sites proposed by the ARB. These sites were tentatively selected by the ARB because they best meet the following characteristics, listed in the order of importance:
1. High PM fine data, or expected significant contribution of PM fine to existing high PM10 data
2. Significant population

3. In PAMS areas, one speciation monitor should be at a maximum precursor site for PM2.5. This may also be a high concentration site.
4. Transport
5. Geographical representation

E. Feedback received from district on proposed speciation monitoring is also listed in Attachment 4. Not all districts have responded.

XII. Transport sites

A. The goal of transport assessment is to identify downwind areas affected by transported PM2.5 and the upwind areas, which are the sources of PM2.5.

B. Transport sites should ideally collect the following information:
1. Hourly PM2.5 concentrations on the surface and aloft; and
2. Meteorological measurements on the surface and aloft.

C. Initially, evaluate the effectiveness of PM2.5 transport assessment tools for a few key corridors. If the available tools are effective, expand transport monitoring in the future.

D. Attachment 5 includes the names of significant air pollutant transport corridors and suggested sites.

XIII. Guidelines for drafting network plan for a Monitoring Planning Area - March 3, 1998

A. The ARB will write a summary report that describes monitoring for the entire state.

B. The network plan will have a separate appendix for each of 18 MPAs

1. 9 districts will prepare and send to the ARB network plans for their jurisdictions.

2. The ARB will develop the plan for the remainder of the state and will ask districts in these areas to review their respective portions of the plan.

3. Consistent organization and structure.

E. The ARB will assemble a statewide plan which will incorporate district plans.

XIV. PM2.5 Monitoring Network Plan Development

April 15, 1998	Draft plans are available for review by state and local agencies. Districts that are preparing plans provide them to ARB. ARB distributes a plan for district review that covers the remainder of the state.
May 15, 1998	Comments on draft plans are due.

June 15, 1998	Revised district plans due to ARB. ARB compiles the individual elements.
July 1, 1998	ARB submits the statewide plan to U.S. EPA**.**

XV. Sources of information

Resources:

- ARB Web Site - PM2.5 Monitoring Network Design, URL address http://www.arb.ca.gov/aqd/pm25/pmfdsign.htm
- EPA Web Site - Ambient Monitoring Technology Information Center, URL address http://www.epa.gov/ttn/amtic
- Guidance for Network Design and Optimum Site Exposure for PM2.5 and PM10, U.S. EPA

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